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④ Collection of specimens and detection of occult blood therein.

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Description

The present invention relates to an occult-blood indicator wipe for the collection of specimens of fecal matter or other bodily substance and for the testing of the specimens for the presence of occult blood.

The presence of blood in feces can signal the existence of a tumor, ulcer, or other medical disorder along the digestive tract. In early stages of development, a tumor or ulcer in the digestive tract may bleed to such a slight extent that the blood, while present in the feces, is not visible. Nonetheless, in such cases, the blood, termed "hidden" or "occult" blood, can usually be detected with one of a number of indicator reagents which change color in the presence of the hemoglobin in blood.

One of the most widely used occult-blood indicator reagents is derived from an extract from the wood of certain species of trees of the *Guaiacum* genus native to the American tropics. The extract, termed guaiac, turns from essentially colorless to blue in the presence of hemoglobin and an oxidizing agent such as hydrogen peroxide. More specifically, the guaiac reagent is sensitive to what is termed "peroxidase activity" which results from the combination of an oxidizing agent with hemoglobin or certain chemically similar compounds.

Testing feces for the presence of occult blood with an occult-blood indicator reagent is a valuable medical diagnostic tool, since such testing can often detect tumors in the digestive tract at an early stage of their development, typically before the tumors manifest other symptoms and at a stage when they can be treated most successfully.

A procedure widely used by physicians and medical laboratories for testing for occult blood in fecal matter makes use of a test slide of the type disclosed in United States patent No. 4,365,970 to Lawrence and Townsley. The test slide of the Lawrence and Townsley patent includes a sheet of guaiac-impregnated indicator paper enclosed in a cardboard envelope. A front panel of the envelope has openings in it for smearing samples of fecal matter on a first slide of the indicator paper. A rear panel of the envelope has an opening for applying a hydrogen peroxide developing solution to a second side of the indicator paper. A blue stain on the indicator paper signifies the presence of occult blood in the sample of fecal matter on the opposite side. Since the blue stain appears on the side of the indicator paper opposite to the samples of fecal matter, the developing solution necessarily soaks through the paper in the test procedure. The indicator sheet of the test slide of the Lawrence and Townsley patent has a control area designated on its second side which includes a positive monitor and a negative monitor. Hemin, a hemoglobin-derived compound, is printed on the positive monitor, but not on the negative monitor. Application of the developing solution to the

control area causes the indicator paper to turn blue at the positive monitor and remain colorless at the negative monitor if the test reagents are properly active and if the test slide has not been contaminated with a compound which yields a false indication of the presence of hemoglobin.

Although the test slide of the Lawrence and Townsley patent is generally satisfactory for use in a doctor's office or a hospital, it has significant disadvantages for home use. An applicator stick must be used to collect each sample of fecal matter from a toilet bowl and to smear the sample on the test slide. The person using the test slide thus has the problem of disposing of the applicator sticks and, after applying the developing solution to the slide, disposing of the test slide itself. Neither the applicator sticks nor the test slide can be flushed down the toilet. Even if the test slide is forwarded to a doctor's office or medical laboratory for analysis, the problem of disposing of the soiled applicator sticks remains for the user.

United States patent No. 4,175,923 to Friend discloses a test for the presence of occult blood in fecal matter which is intended to be carried out at home. The test makes use of an indicator paper prepared by impregnating a sheet of absorbent paper with guaiac reagent. A portion of the indicator paper is also impregnated with blood. The test of the Friend patent involves applying a developing solution to a sheet of the indicator paper and then tossing the sheet into a toilet bowl to contact the paper with the water in the bowl. The developing solution causes the portion of the indicator paper impregnated with blood to turn blue if the guaiac reagent and developing solution are properly active. If stools in the toilet bowl contain occult blood, blood will disperse in the water in the bowl. Blood in the water in the toilet bowl will in turn cause the remainder of the indicator paper to turn blue. After allowing time for the color of the indicator paper to change, the paper can be flushed down the toilet with the stools.

Although the occult-blood detection test of the Friend patent is satisfactory in principle, it is limited in a number of respects. Ordinarily, for occult blood in fecal matter to be detected by the test, the blood must disperse in the water of toilet bowl. Such dispersal necessarily dilutes the blood and thus reduces the sensitivity of the test. In addition, the test results may be suspect as a consequence of the presence of contaminants in the toilet bowl.

According to the present invention there is provided an occult-blood indicator wipe (2) in the form of a pad (4) suitable for use in an occult-blood detection test in which a specimen is tested for the presence of occult-blood, the wipe (2) comprising:

a first, hand-contact, surface (11) enabling the wipe (2) to be manipulated; and
a second, occult-blood detection-test, surface (10);
there being defined on the detection-test sur-

face (10) a specimen-collection region (12) for collecting a specimen of a bodily substance and for supporting the specimen and there being dispersed on, or located proximate to the specimen-collection region, a peroxidase-activity indicator reagent which, in the presence of occult blood in the specimen, on application of oxidizing-agent development fluid to the specimen-collection region of the indicator wipe (2), changes colour;

wherein the wipe (2) is of a size and form which is capable of being manipulated by hand, and is fabricated from a pliable material comprising a plurality of sheets of absorbent, low-wet-strength tissue paper (6) disposed one on top of the other to form a multilayer structure, the sheets being joined together around their periphery (8) with at least one of the sheets of tissue paper between (a) a first, reagent free, outermost sheet (18) of tissue paper at the detection-test surface (10) of the pad and (b) a second reagent free, outermost sheet (20) of tissue paper at the hand-contact surface (11) of the pad defining an indicator sheet, an indicator region of the or each indicator sheet being impregnated with the peroxidase-activity indicator reagent, and having a sufficiently low wet strength to permit the wipe (2) to be disposed of in a toilet, the wipe (2) further having a resistance to seepage by the developing fluid from the detection-test surface (10) to the hand-contact surface (11) sufficient to permit the hand-contact surface (11) of the substrate to remain dry to the touch, after application of an occult-blood-detection-test dose of the oxidizing-agent developing fluid to the detection-test surface (10), for a sufficient time to enable the peroxidase-activity indicator reagent to indicate the presence of occult blood in the specimen.

Such a wipe is suitable for use in the home and avoids problems of the prior art noted above.

A wide range of sizes and shapes are usable. A preferred indicator wipe is in the form of a generally rectangular pad from 80 mm to 150 mm wide and from 100 mm to 200 mm long. Dimensions of 100 mm wide by 150 mm long are particularly preferred. Alternatively, the indicator wipe could be circular or oval in shape. The indicator wipe could also be fabricated as a mitt to be worn over the hand.

The indicator wipe has a sufficiently high resistance to seepage by the developing fluid from the detection-test surface to the hand-contact surface to permit the hand-contact surface to remain dry for the duration of an occult-blood detection test.

A preferred indicator wipe is a generally rectangular pad formed from a number of sheets of absorbent, porous, soft, low-wet-strength paper of the type used as toilet tissue. The sheets are arranged one on top of the other. For example, a pad composed of nine plies of tissue paper is particularly preferred. However, either a greater or lesser number of plies may be advantageous in certain applications, depending, for example, on the weight and stiffness of the individual plies of tissue paper.

In an indicator wipe in accordance with the invention formed from plies of low-wet-strength tissue paper, the plies are preferably joined together around their periphery. The plies may be joined by crimping. Crimping the plies together around the periphery of the pad permits the plies to separate from one another readily when the indicator wipe is soaked with water. Consequently, the indicator wipe may be safely disposed of in a toilet. Furthermore, a pad formed from plies of tissue paper crimped together is economical to manufacture. Alternatively, the plies of tissue paper may be joined with an adhesive, preferably applied around the periphery of the pad. The adhesive is preferably water soluble or otherwise water degradable to permit the indicator wipe to be disposed of readily in a toilet.

The indicator wipe of the present invention is preferably biodegradable.

A preferred peroxidase-activity indicator reagent for the invention is guaiac reagent. As used herein, the term guaiac reagent includes resin guaiac; individual components of resin guaiac such as alpha-guaiacconic acid, beta-guaiacconic acid and guaiaclic acid, guaiaretic acid and guaiacin; and mixtures thereof. Other peroxidase-activity indicator reagents which are suitable in certain applications include aniline and its derivatives, o-tolidine, o-toluidine, p-toluidine, benzidine, tetramethylbenzidine, di-anisidine, o-cresol, r-cresol, alpha-naphthol, beta-naphthol, catechol, guaiacol, pyrogallol, mixtures thereof, and mixtures of one or more of the preceding with a guaiac reagent. A preferred oxidizing-agent developing fluid is a solution of hydrogen peroxide.

In a preferred indicator wipe formed from plies of tissue paper, all of the plies are impregnated with guaiac reagent except a first outermost sheet of tissue paper adjacent to the occult-blood detection-test surface of the wipe and a second outermost sheet of tissue paper adjacent to the hand-contact surface. The outermost sheets are not impregnated with guaiac reagent to obviate any skin irritation which might be caused by contact with the guaiac reagent. In general, any single ply or all plies or any combination of plies may be impregnated with peroxidase-activity indicator reagent, if required, provided that the indicator reagent is located sufficiently close to the detection-test surface of the wipe to permit the developing solution and hemoglobin from occult blood in specimens on the detection-test surface to interact with the indicator reagent to provide a visible indication signalling the presence of occult blood.

Although for manufacturing simplicity it is preferred that entire sheets of tissue paper included in multiple-ply indicator wipes are impregnated with guaiac reagent, it is not necessary. If desired, guaiac reagent may be dispersed on only a portion of a sheet of tissue paper. The area of a sheet of tissue paper on which guaiac reagent is dispersed, be it the entire sheet or only a portion of the sheet, may be referred to as an indicator region of the

sheet.

A preferred procedure for impregnating tissue paper with guaiac reagent involves soaking the tissue paper in a solution of guaiac reagent and then allowing the solvent to evaporate, which leaves a deposit of guaiac reagent dispersed more or less uniformly on the paper. Preferred solutions for impregnating tissue paper with guaiac reagent may be prepared by dissolving guaiac reagent in a volatile organic solvent such as methanol, ethanol, isopropanol, or acetone to form a solution which is from 0.5 percent to 5 percent guaiac reagent by weight. A particularly preferred impregnating solution is an approximately one-percent by weight solution of guaiac reagent in ethanol. An entire roll of tissue paper may be impregnated with guaiac reagent in a single operation, after which sheets of tissue paper impregnated with guaiac regions may be cut from the roll.

The detection test surface of the indicator wipe preferably includes an indicator-activity verification region separate from the specimen-collection region. An indicator-activity test reagent is preferably dispersed on or located proximate to the indicator-activity verification region, and the peroxidase-activity indicator reagent is dispersed on or proximate to the verification region as well. The indicator-activity test reagent is capable of interacting with the peroxidase-activity indicator reagent and the developing fluid to provide an indication characteristic of the presence of occult blood. Thus, if a dose of hydrogen peroxide solution is sprayed on the indicator-activity verification region of such a preferred indicator wipe employing guaiac reagent as the peroxidase-activity indicator reagent, the guaiac reagent ordinarily turns from essentially colorless to blue in the verification region. Failure of the guaiac reagent in the verification region to change color is a signal that either the guaiac reagent or the developing fluid may be inactive for some reason and that any negative result of the occult-blood detection test should be suspect.

The indicator-activity test reagent preferably includes hematin, a derivative of hemoglobin with the following systematic name: [7,12-diethyl-3,8,13,17-tetramethyl-21H, 23H-porphine-2,18-dipropanoato(2-)-N²¹, N²², N²³, N²⁴]-hydroxy-iron. Hematin may be applied to the indicator-activity verification region as a basic solution in a mixture of ethanol and water. Any reagent exhibiting peroxidase-like activity; such as hemin, hemoglobin, or whole blood (either human blood or animal blood); may be used as an indicator-activity test reagent if desired, since such reagents provide a reaction with peroxidase-activity indicator reagents characteristic of occult blood.

The indicator-activity verification region is preferably substantially smaller in area than the specimen-collection region and is preferably clearly marked on the detection-test surface of the indicator wipe. The shape of the indicator-activity verification region is not critical. The verification

region, for example, may be generally circular, rectangular, or of another shape. More than one indicator-activity verification region may be included if desired. A corresponding region which includes no indicator-activity test reagent may be marked on the detection-test surface as well to serve as a neutral-response region. Ink used for marking the various regions on the detection-test surface should be safe for human contact and should not give rise to a false indication of the presence of occult blood or otherwise distort the results of the test.

The indicator wipe should not include any contaminant in the specimen-collection region which would give rise to a false indication of the presence of occult blood. Commercially available grades of tissue paper such as used for toilet tissue generally do not include such contaminants.

The detection-test surface of an indicator wipe incorporating guaiac reagent is advantageously white or yellow in color to provide a visual contrast with the guaiac reagent which turns blue on contact with occult blood. To less advantage, the surface may be colored pink. A green or blue color for the detection-test surface in this application, while possible, is generally not preferred, since a blue or green background tends to mask the color change provided by the guaiac reagent.

Preferred indicator wipes for the invention retard the seepage of developing fluid from the detection-test surface of the indicator wipe to the hand-contact surface for at least 30 seconds to give the user time to hold the wipe in his hand and observe the test results before dampness is detected on the hand-contact surface. The hand-contact surface of a preferred indicator wipe made up of nine plies of tissue paper generally remains dry to the touch indefinitely after a standard occult-blood detection-test dose of 0.9 ml of a solution of hydrogen peroxide in an ethanol-water mixture is applied to the detection-test surface on the opposite side of the wipe. Although it is possible to soak such an indicator wipe through in less than 30 seconds by applying three times the standard test dose of hydrogen peroxide solution, when the standard test dose is applied, the indicator solution generally evaporates to dryness from the detection-test surface before it can penetrate to the hand-contact surface of the indicator wipe.

It is believed that the remarkable resistance to seepage from front to back in a pad of plies of tissue paper joined at their periphery is a result of the light contact the various plies make with one another in the central region of the pad. Fluid tends to flow by capillary action laterally within a sheet of tissue paper far more readily than it tends to flow from one sheet of tissue paper to the next. Moreover, the first four of five plies or so of the nine plies of tissue paper in preferred indicator wipes have sufficient fluid-holding capacity to absorb all of the developing fluid applied to the wipe in a typical occult-blood detection test.

Although in principle a moisture-impermeable

polymer film could be incorporated in the indicator wipe for the invention to serve as a moisture barrier, conventional polymer films typically have too great a wet strength to be readily disposable in a toilet.

It is preferred to store indicator wipes which incorporate guaiac reagent in individual air-tight packages such as sealed foil envelopes, since guaiac reagent is subject to degradation by oxygen in the air.

Brief description of the drawing

Preferred indicator wipes for the invention are described below with reference to the following figures.

Fig. 1 is an oblique view of an occult-blood indicator wipe for the present invention.

Fig. 2 is a partial cross-sectional side view of the indicator wipe of Fig. 1 taken wlong line 2—2.

Best mode for carrying out the invention

Turning now to Fig. 1, an indicator wipe 2 includes a pad 4. As shown in Fig. 2, the pad 4 is made up of nine plies of tissue paper 6 arranged one on top of the other. The plies of tissue paper 6 are crimped together around the periphery 8 of the pad 4. A first side 10 of the pad 4 defines an occult-blood detection test surface for the indicator wipe and a second side 11 defines a hand-contact surface. Printed on the detection-test surface 10 are designations of three regions; a specimen collection region 12, an indicator-activity verification region 14 and a neutral-response region 16. The indicator-activity verification region 14 is denoted "Positive" and the neutral-response region 16 is denoted "Negative".

An outermost ply of tissue paper 18 adjacent the detection-test surface 10 of the indicator wipe 2 and an outermost ply 20 adjacent to hand-contact surface 11 are free of guaiac reagent. The remaining seven plies of tissue paper laying between the two outermost plies 18 and 20 are impregnated with guaiac reagent. An approximately one-percent by weight solution of guaiac reagent in ethanol is used to impregnate the seven intermediate plies of tissue paper. The sheets of tissue paper are impregnated with guaiac reagent by saturating them with the guaiac solution and then allowing the solvent to evaporate.

A hematin reagent is absorbed in the indicator-activity verification region 14. The hematin reagent is deposited within the indicator-activity verification region 14 by moistening the region 14 with a hematin solution, then allowing the solvent to evaporate from the moistened area to leave behind a deposit of hematin reagent. The hematin solution is prepared as follows: Water and ethanol are mixed in the proportion of 25 percent by volume water and 75 percent by volume ethanol. Sodium hydroxide is added to the water/ethanol mixture in an amount sufficient to form a solution of 0.01 molar sodium hydroxide. To this basic water/ethanol solution is added a quantity

of hematin sufficient to yield a solution containing 6 mg of hematin per liter of solution.

The indicator wipe 2 and a developing solution made up of 3 percent by weight hydrogen peroxide, 22 percent by weight water, and 75 percent by weight ethanol can be used as follows to test for the presence of occult blood in fecal matter. The user first obtains a sample of fecal matter by defecating. A specimen of the fecal matter is collected on the specimen-collection region 12 of the indicator wipe 2 by contacting the region 12 of the indicator wipe 2 with the fecal matter while defecating or by patting in the anal area with the region 12 of the wipe 2. The user then applies a dose of the developing solution from a spray applicator to the specimen of fecal matter on the indicator wipe. Typically, three squirts are applied, with each squirt of the applicator delivering roughly 0.18 ml of solution. In addition, single-squirt doses of developing solution are applied respectively to the indicator-activity verification region 14 and to the neutral-response region 16 of the wipe. If the guaiac reagent and the developing solution are properly active, the indicator wipe will change color in the indicator-activity verification region 14. If the indicator wipe has not been contaminated with a substance which gives a false indication of occult blood, the wipe will remain essentially colorless in the neutral response region 16. Thus, if the indicator wipe 2 either fails to turn blue in the indicator-activity verification region 14 or turns blue in the neutral response region 16, the results of the test are suspect. If the indicator wipe does not change color where it contacts the specimen of fecal matter, the specimen probably contains at most an insignificant quantity of occult blood. If, on the other hand, the indicator wipe turns blue where it contacts the specimen, the presence of occult blood is indicated and the user should consult a physician. After the test is completed the user can toss the indicator wipe into the toilet bowl and flush it away.

The indicator wipe may also be made of flushable felt, wadding, sponge or fabric, if desired. A pad suitable for an indicator wipe for the invention may be made from sheets of creped, low-wet-strength tissue. The indicator wipe may be folded so that the indicator-activity verification region and neutral-response region generally face away from the specimen-collection region to prevent the indicator-activity verification and neutral-response regions from becoming soiled with fecal matter during the collection of specimen. After collection of the specimen, the wipe can be unfolded to permit the indicator fluid to be applied conveniently to all three regions. The indicator-activity verification region and neutral-response region may be covered with a removable, flushable paper strip or other suitable barrier to soiling if desired. The indicator wipe may be used with peroxidase-activity indicator reagents other than guaiac reagent and may be used to detect occult blood in bodily substances other than fecal matter.

Claims

1. An occult-blood indicator wipe in the form of a pad suitable for use in an occult-blood detection test in which a specimen is tested for the presence of occult-blood, the wipe comprising:

a first, hand-contact, surface enabling the wipe to be manipulated; and

a second, occult-blood detection-test, surface; there being defined on the detection-test surface a specimen-collection region for collecting a specimen of a bodily substance and for supporting the specimen and there being dispersed on, or located proximate to the specimen-collection region, a peroxidase-activity indicator reagent which, in the presence of occult blood in the specimen, on application of oxidizing-agent development fluid to the specimen-collection region of the indicator wipe, changes colour;

wherein the wipe is of a size and form which is capable of being manipulated by hand, and is fabricated from a pliable material comprising a plurality of sheets of absorbent, low-wet-strength tissue paper disposed one on top of the other to form a multilayer structure, the sheets being joined together around their periphery with at least one of the sheets of tissue paper between (a) a first indicator free, outermost sheet of tissue paper at the detection-test surface of the pad and (b) a second, indicator free, outermost sheet of tissue paper at the hand-contact surface of the pad defining an indicator sheet, an indicator region of the or each indicator sheet being impregnated with the peroxidase-activity indicator reagent, and having a sufficiently low wet strength to permit the wipe to be disposed of in a toilet, the wipe further having a resistance to seepage by the developing fluid from the detection-test surface to the hand-contact surface sufficient to permit the hand-contact surface of the substrate to remain dry to the touch, after application of an occult-blood-detection-test dose of the oxidizing-agent developing fluid to the detection-test surface, for a sufficient time to enable the peroxidase-activity indicator reagent to indicate the presence of occult blood in the specimen.

2. An occult-blood indicator wipe according to claim 1, wherein the peroxidase-activity indicator reagent dispersed on, or located proximate to, the specimen collection region of the pipe comprises a guaiac reagent and the oxidising-agent developing solution to be applied to the specimen collection region comprises a solution of hydrogen peroxide.

3. An occult-blood indicator wipe according to claim 1 or 2, wherein each sheet of tissue paper located between the first and second outermost sheets is an indicator sheet.

4. An occult-blood indicator wipe according to claim 1, 2 or 3, wherein the sheets of tissue paper are joined together around their periphery by crimping or by a water-degradable adhesive.

5. An occult-blood indicator wipe according to any preceding claim, wherein the pad comprises nine sheets of tissue paper.

6. An occult-blood indicator wipe according to any preceding claim, wherein the detection-test surface of the indicator wipe has an indicator-activity verification region defined on it for testing the activity of the peroxidase-activity indicator reagent and the developing fluid, the indicator-activity verification region being separate from the specimen-collection region, an indicator-activity-test reagent and peroxidase-activity indicator reagent being dispersed on, or proximate to, the indicator-activity verification region, the indicator-activity-test reagent being capable of interacting with developing fluid applied to the indicator-activity verification region and with the peroxidase-activity indicator reagent to provide an indication characteristic of occult blood.

7. An occult-blood indicator wipe according to claim 6, wherein the indicator-activity-test reagent includes hematin.

Patentansprüche

1. Okkultblutindikatorwischer in Form eines bei einem Test zum Okkultblutnachweis, bei dem eine Probe auf die Anwesenheit von Okkultblut untersucht wird, verwendbaren Tampons, umfassend:

einer erste Handkontaktoberfläche, die den Wischer zur Handhabung befähigt, und
eine zweite Oberfläche zum Okkultblutnachweis, wobei auf der Nachweistestoberfläche ein Probensammelbereich zur Sammlung der Probe einer Körpersubstanz und zum Festhalten der Probe festgelegt ist und wobei auf dem Probensammelbereich ein Peroxidaseaktivität-Indikatorreagens, das in Gegenwart von Okkultblut in der Probe bei Applikation eines Oxidationsmittel-Entwicklungsfluidums auf den Probensammelbereich des Indikatorwischers seine Farbe ändert, dispergiert ist oder sich nahe dem Probensammelbereich befindet;

wobei der Wischer eine für die Handhabung von Hand geeignete Größe und Form aufweist

und aus einem nachgiebigen Material, umfassend eine Mehrzahl von Lagen aus absorbierendem, eine geringe Naßfestigkeit aufweisendem Seidenpapier, die aufeinanderliegend ein mehrlagiges Gebilde bilden und an ihrer Peripherie miteinander verbunden sind, gefertigt ist, wobei mindestens eine der Lagen Seidenpapier zwischen (a)

einer ersten, indikatorfreien äußersten Lage Seidenpapier an der Nachweistestoberfläche des Tampons und (b) einer zweiten, indikatorfreien äußersten Lage Seidenpapier auf der Handkontaktoberfläche des Tampons eine Indikatorlage festlegt, wobei ein Indikatorbereich der oder jeder Indikatorlage mit dem Peroxidaseaktivität-Indikatorreagens getränkt ist, wobei die Naßfestigkeit so gering ist, daß der Wischer in einer Toilette beseitigt werden kann, und wobei der Wischer gegenüber einem Durchsickern des Entwicklungsfluidums von der Nachweistestoberfläche zu der Handkontaktoberfläche ausreichend beständig ist, damit die Handkontaktoberfläche des Substrats nach Applikation einer (bestimm-

ten) Okkultblutnachweistestdosis des Oxidationsmittel-Entwicklungsfluidums auf die Nachweistestoberfläche ausreichend lange berührungstrocken bleibt, um das Peroxidaseaktivität-Indikatorreagens zur Anzeige der Anwesenheit von Okkultblut in der Probe zu befähigen.

2. Okkultblutindikatorwischer nach Anspruch 1, dadurch gekennzeichnet, daß das auf dem Probensammelbereich des Wischers dispergierte oder sich nahe diesem befindliche Peroxidaseaktivität-Indikatorreagens aus einem Guajac-Reagens und die auf den Probensammelbereich zu applizierende Oxidationsmittel-Entwicklungsfluidlösung aus einer Wasserstoffperoxidlösung bestehen.

3. Okkultblutindikatorwischer nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß jede Lage Seidenpapier, die sich zwischen den ersten und zweiten äußersten Lagen befindet, eine Indikatorlage darstellt.

4. Okkultblutindikatorwischer nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, daß die Lagen an ihrem Umfang durch Falten oder mit Hilfe eines durch Wasser abbaubaren Klebstoffs verbunden sind.

5. Okkultblutindikatorwischer nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Tampon neun Lagen Seidenpapier umfaßt.

6. Okkultblutindikatorwischer nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Nachweistestoberfläche des Indikatorwischers einen darauf festgelegten, Indikatoraktivität verifizierenden Bereich zum Testen der Aktivität von Peroxidaseaktivität-Indikatorreagens und Entwicklungsfluidum aufweist, daß der Indikatoraktivität verifizierende Bereich von Probensammelbereich getrennt ist, daß ein Indikatoraktivität-Testreagens und ein Peroxidaseaktivität-Indikatorreagens auf dem Indikatoraktivität verifizierenden Bereich dispergiert sind oder sich nahe diesem befinden und daß das Indikatoraktivität-Testreagens zur Wechselwirkung mit einem auf den Indikatoraktivität verifizierenden Bereich applizierten Entwicklungsfluidum und mit dem Peroxidaseaktivität-Indikatorreagens unter Lieferung eines für Okkultblut charakteristischen Hinweises fähig ist.

7. Okkultblutindikatorwischer nach Anspruch 6, dadurch gekennzeichnet, daß das Indikatoraktivität-Testreagens Hämatin enthält.

Revendications

1. Un tampon indicateur de sang occulte en forme de coussin convenant à une utilisation dans un test de détection de sang occulte au cours duquel on teste la présence de sang occulte dans un échantillon, le tampon comprenant:

une première surface de prise manuelle permettant la manipulation du tampon; et
une deuxième surface de test de détection de sang occulte;

une région de collecte d'échantillon étant définie sur la surface de test de détection en vue de

recueillir un échantillon de substance corporelle et de servir de support à l'échantillon et, de disperser sur cette région ou à proximité de celle-ci, un réactif indicateur d'activité de peroxydase qui change de couleur, en présence de sang occulte qui du fait de l'application du fluide de développement de l'agent oxydant à la région de collecte d'échantillon du tampon indicateur;

le tampon étant de dimension et de forme qui permettent de le prendre à la main et étant obtenu à partir d'une matière pliable comprenant une pluralité de feuilles de papier tissu absorbant, à faible résistance à l'état humide, disposées l'une au-dessus de l'autre pour former une structure multicouche, lesdites feuilles étant assemblées autour de leur périphérie ainsi qu'au moins l'une des feuilles de tissu de papier entre (a) une première feuille externe, de papier tissu exempt de réactif indicateur se trouvant contre la surface de test de détection du coussin et (b) une deuxième feuille externe de papier tissu exempt de réactif indicateur se trouvant contre la surface de prise manuelle du coussin et définissant une feuille indicatrice, une région indicatrice de chaque feuille indicatrice étant imprégnée du réactif indicateur d'activité peroxydase et présentant à l'état humide une résistance suffisamment faible pour permettre de se débarrasser du tampon dans la cuvette des toilettes, le tampon présentant en outre une résistance à l'infiltration, par le fluide de développement provenant de la surface de test de détection vers la surface de prise manuelle, suffisante pour permettre à la surface de prise manuelle du substrat de demeurer sèche au toucher après application d'une dose de test de détection de sang occulte du fluide de développement à base d'agent oxydant vers la surface de test de détection, pendant un temps suffisant pour permettre au réactif indicateur d'activité peroxydase d'indiquer la présence de sang occulte dans l'échantillon.

2. Un tampon indicateur de sang occulte selon la revendication 1, dans lequel le réactif indicateur d'activité peroxydase dispersé ou disposé à proximité de la région de collecte d'échantillon du tampon comprend un réactif à base de guaiac et la solution de développement à base d'agent oxydant à appliquer sur la région de collecte d'échantillon comprend une solution de peroxyde d'hydrogène.

3. Un tampon indicateur de sang occulte selon la revendication 1 ou 2, dans lequel chaque feuille de papier tissu disposé entre les deux feuilles extrêmes est une feuille indicatrice.

4. Un tampon indicateur de sang occulte selon la revendication 1, 2 ou 3, dans lequel les feuilles de papier tissu sont réunies entre elles autour de leur périphérie par gaufrage ou à l'aide d'une colle dégradable à l'eau.

5. Un tampon indicateur de sang occulte dans lequel le tampon comprend neuf feuilles de papier tissu.

6. Un tampon indicateur de sang occulte, dans lequel la surface de détection de test du tampon indicateur comprend une région de vérification

d'activité indicatrice délimitée sur celle-ci pour tester l'activité du réactif indicateur d'activité peroxydase et le fluide de développement, la région de vérification de l'activité indicatrice étant séparée de la région de collecte d'échantillon, un réactif de test de l'activité indicatrice et un réactif indicateur d'activité de peroxydase étant dispersés ou disposés à proximité de la région de vérification de l'activité indicatrice, le réactif de

test d'activité indicatrice étant capable d'interagir avec le fluide de développement appliqué sur la région de vérification d'activité indicatrice et avec le réactif indicateur d'activité peroxydase pour procurer une indication caractéristique de la présence de sang occulte.

7. Un tampon indicateur de sang occulte, selon la revendication 6, dans lequel le réactif de test d'activité indicatrice comprend de l'hématine.

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FIG.1

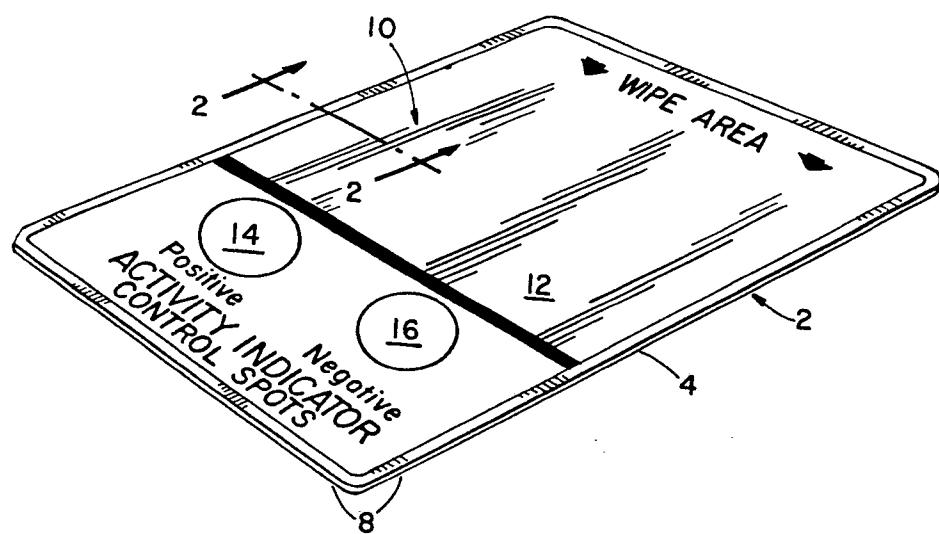


FIG.2

